

A B S T R A C T

The amplifying optical fiber (1) comprises a single-mode core (10) and a multimode core (20) surrounding the
5 single-mode core, the multimode core containing a doped layer referred to as a "doped ring" (21) and having a certain concentration of active rare earth ions (6) to perform amplification by active rare earth ions on at least one optical signal for injection into the
10 amplifying fiber. The fiber is dimensioned so that the product of its length multiplied by its Raman efficiency is greater than or equal to 0.5 W^{-1} . In addition, the fiber presents absorption defined by an absorption coefficient expressed in dB/m, which absorption presents,
15 at a certain wavelength, a maximum value referred to as the "absorption maximum", the fiber presents accumulated absorption, corresponding to the product of its length multiplied by the absorption maximum, that is greater than or equal to 100 dB. The invention also provides an
20 amplifier including such a fiber, a single-mode pump, and a multimode pump.